



Facts About: Micro-Bioretenion and Similar Micro-Scale Practices

Stormwater Best Management Practices (BMPs)

Micro-scale practices are small environmental site design (ESD) water quality treatment devices that capture and treat stormwater runoff from impervious areas less than one acre in size. These practices typically include natural systems, vegetation, and soils. Unlike larger, structural practices, these smaller devices can provide stormwater management at the source.

Micro-Bioretenion

Micro-bioretenion practices capture and treat runoff by passing it through a mixture of sand, soil, and organic matter. The filtered stormwater is returned to the conveyance system or is partially filtrated into the soil. These practices are very adaptable for a variety of uses in landscaped areas. They should drain within 24-48 hours after a rain event, and the best plants are native plants that can tolerate both wet and dry conditions. The plants are a critical part of the practice, and without them it would simply be a physical filter. Plants enhance nutrient and pollutant uptake, and can also provide habitat and aesthetic value. The plants also slow rainfall and keep the soil healthy so it can filter effectively.



Micro-bioretenion

Enhanced Filter

Enhanced filters are modified versions of micro-bioretenion practices that increase water quality treatment and groundwater recharge. They use a stone reservoir underneath the filtering materials to collect runoff and remove nutrients for infiltration into the surrounding soil.

Infiltration Berm

An **infiltration berm** is a mound of earth made up of soil and stone that is placed along the contour of a relatively gentle slope. It slows down and retains stormwater for infiltration.



Infiltration berm

Landscape Infiltration

Landscape infiltration practices are native plant gardens that initially store rainwater and then filter it through the planting soil and gravel media below, allowing for infiltration into native soils. They use vegetation to naturally filter out pollutants and absorb runoff. These are often found in residential or commercial areas and filter a small drainage area.



Landscape infiltration

Design Variants

- Micro-bioretenion
- Enhanced filter
- Landscape infiltration
- Infiltration berm

Pollutant Removal Efficiencies

- Sediments 80%
- Phosphorus 66%
- Nitrogen 56% (as part of a system of ESD practices)

More Information

For information on specific design criteria, go to Maryland's Stormwater Design Manual:
mde.maryland.gov/programs/water/StormwaterManagementProgram/Pages/stormwater_design.aspx